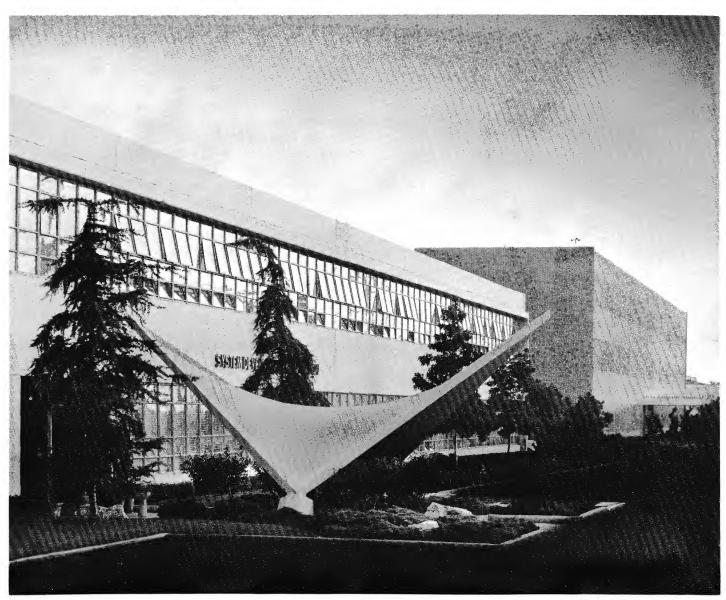# SYSTEM DEVELOPMENT CORPORATION

System Development Corporation was chartered as a nonprofit organization to serve the public welfare and security of the United States in its field of special technical competence, the information system sciences. The corporation provides its specialized services to many agencies of the government at federal, state and local levels, and to nonprofit educational and scientific organizations.

SDC's basic policy guidance is provided to its management by the Board of Trustees, which represents the public interest in the affairs of the corporation. The organization's daily management is carried out by the President, Vice Presidents, Secretary, Treasurer, the President's staff, and the Management Council.

Corporate headquarters are in Santa Monica, California. However, SDC is broadly based geographically with facilities in Lexington, Massachusetts; Washington, D.C.; Falls Church, Virginia; Colorado Springs, Colorado; and Dayton, Ohio. Field offices are also maintained at many military bases in the United States, Canada, Europe, the Near and Far East.

Origins. SDC's corporate origins are in a research study in organizational behavior conducted in the Systems Research Laboratory of The RAND Corporation in 1952 and 1953. These studies were designed to define problems of information systems and the factors that might affect human performance in such an environment. These studies resulted in RAND being

awarded a contract to develop and install a training program for crews of the air defense network throughout continental United States. In December 1955, the System Development Division of RAND was established to perform this work for the manual air defense system. In addition, it was to adapt the program to the SAGE (Semi-Automatic Ground Environment) air defense system and to install and maintain computer programs for each SAGE center at field sites throughout the country.

By 1956, the RAND Board of Trustees recognized that the scope and nature of the division's work had led to the edge of an important new technology and that to realize the potential of this new field, an independent organization should be established to concentrate on its development. The System Development Division was incorporated in California as System Development Corporation on November 23, 1956 and, in December 1957, began independent operations in its own quarters.

Technical Role. The corporation's competence in information technology has developed from its earliest military applications through increasingly sophisticated military systems. It has expanded from this base to meet other emerging public needs in such fields as education, medicine, and law.

SDC, which does not develop or produce hardware, is concerned with the development and production of materials, commonly termed "software," for command or management information processing systems. These materials—such as computer program systems, methods and procedures handbooks, orientation and training materials—convert potential general-purpose capability, represented by hardware and an operations crew, into a complete, functioning system adapted to the particular planning and operating needs of the using organization.

Particularly in the work on military command systems, SDC's work extends beyond the production and documentation of computer programs. Military operational procedures, special environmental factors, and human factors in information processing must be incorporated along with the computer programs for command and control. SDC develops operational simulation aids and procedures which realistically incorporate live system functions. Methods and procedures handbooks and orientation materials are prepared for the user agency. System exercises are designed and system training materials developed and used in live-system tests and operational simulations.

Among SDC's innovative contributions to information system technology are: the development of the concepts and techniques of system training; the development of JOVIAL, a programming language; the development of a methodology for operations simulation; the application of information processing and system development methodologies in such areas as education, medicine, and intelligence; and most recently, the development of a system for computer time-sharing. Other technological advances are under development.

Research Program. SDC conducts research and developmental projects in man-machine relationships, information processing and operations research. Such research may be funded by corporate fee, co-supported grants, or by such external sponsors as the Advanced Research Projects Agency (ARPA), the Office of Naval Research, the Air Force Office of Scientific Research, the United States Office of Education, the National Science Foundation, Carnegie Corporation, and colleges and universities.

Research at SDC ranges from fundamental studies to projects with a more immediate application. In the latter category is the research in support of contractual activities including the development of particular systems, computer programs or training programs, for such organizations as the Air Defense Command, the Electronic Systems Division of the Air Force Systems Command, the Office of Civil Defense, and the Air Force Space Systems Division.

A major research and development program in command and control has been conducted by SDC for the Advanced Research Projects Agency of the Department of Defense. The central objective of this program has been the effective application of automated information processing to the needs of military command organizations. A computer-based laboratory designed specifically for research in command systems has been established to support this program.

SDC has also conducted research in the application of information system technology to the field of medicine. Early research efforts in this field were company sponsored. Subsequent efforts have been undertaken for the Veterans Administration, UCLA, and the Corporación de Servicio del Centro Médico de Puerto Rico.

In addition, SDC conducts an independent research program in the areas of artificial intelligence, information retrieval, information processing, advanced programming, mathematics and operations research, decision processes, and education and training.

SDC's research efforts are intended not only to improve the corporation's technical products and, in turn, benefit the agencies that rely on SDC's services, but also to advance basic knowledge in the information sciences and the technology involved in information-processing, communication, and man-machine systems.

Corporate Resources. At SDC, the experienced professional-technical staff is regarded as the corporation's most important resource. In the SDC environment, challenging ideas and an emerging technology converge to provide the opportunity for professional stimulation and growth. Corporate experience has demonstrated that personnel trained in engineering, data processing, human factors and operations research can be effectively organized into interdisciplinary teams to handle the problems posed by complex large-scale information systems.

SDC's computer-centered laboratory facilities constitute another significant corporate resource and include: the System Simulation Research Laboratory (Philco 2000-210); the Command Research Laboratory (IBM AN/FSQ-32); the Satellite Control Computer Program Development Center (Control Data 1604-A & B). Among other computers used by the corporation are: IBM-7094; IBM AN/FSQ-7; Burroughs D-825; IBM AN FSQ-8; IBM 7090; IBM AN/FSQ-31V; IBM 1401; and Control Data 160-A. Use of a wide variety of computers extends the staff's background of experience in employing whatever computer is appropriate for the task and maintains essential corporate impartiality toward particular kinds of hardware.